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(54) **PROGRAM CREATING SYSTEM, PROGRAM CREATING PROGRAM, AND PROGRAM CREATING MODULE**

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(57) **ABSTRACT**

An accepting unit (**110**) accepts various parameters required to create a program from a setting apparatus (**500**) through a network. A producing unit (**112**) loads a model of a program code from a model storing unit (**128**) on the basis of the parameters and replaces a part of the program code with the parameters to produce a source code. An instructing unit (**120**) detects that the producing unit (**112**) produces the source code to start a compiling unit (**114**). The compiling unit (**114**) compiles the source code produced by the producing unit (**112**) to create a research program. In this manner, a research program can be automatically created without advanced special knowledge.

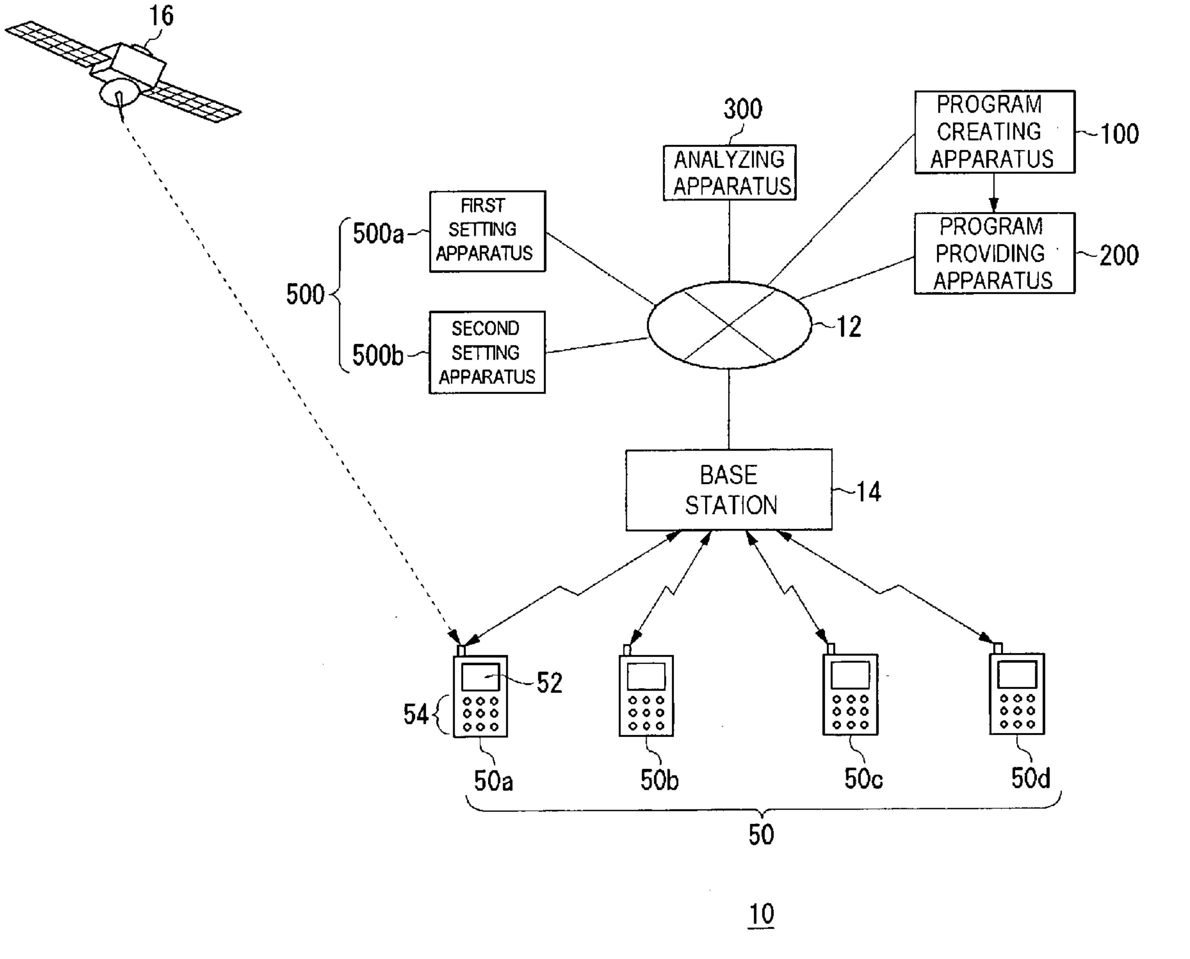


FIG. 1

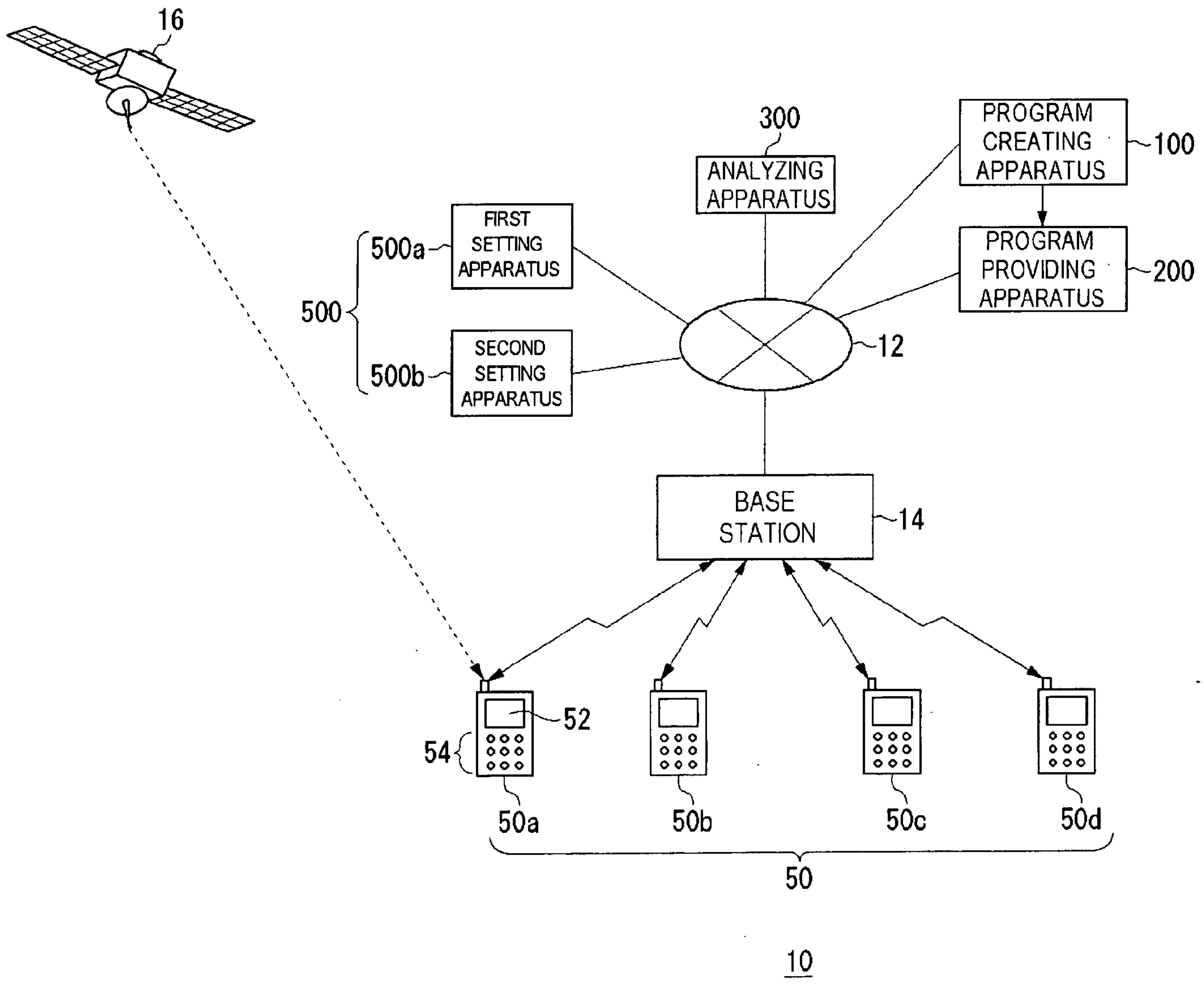
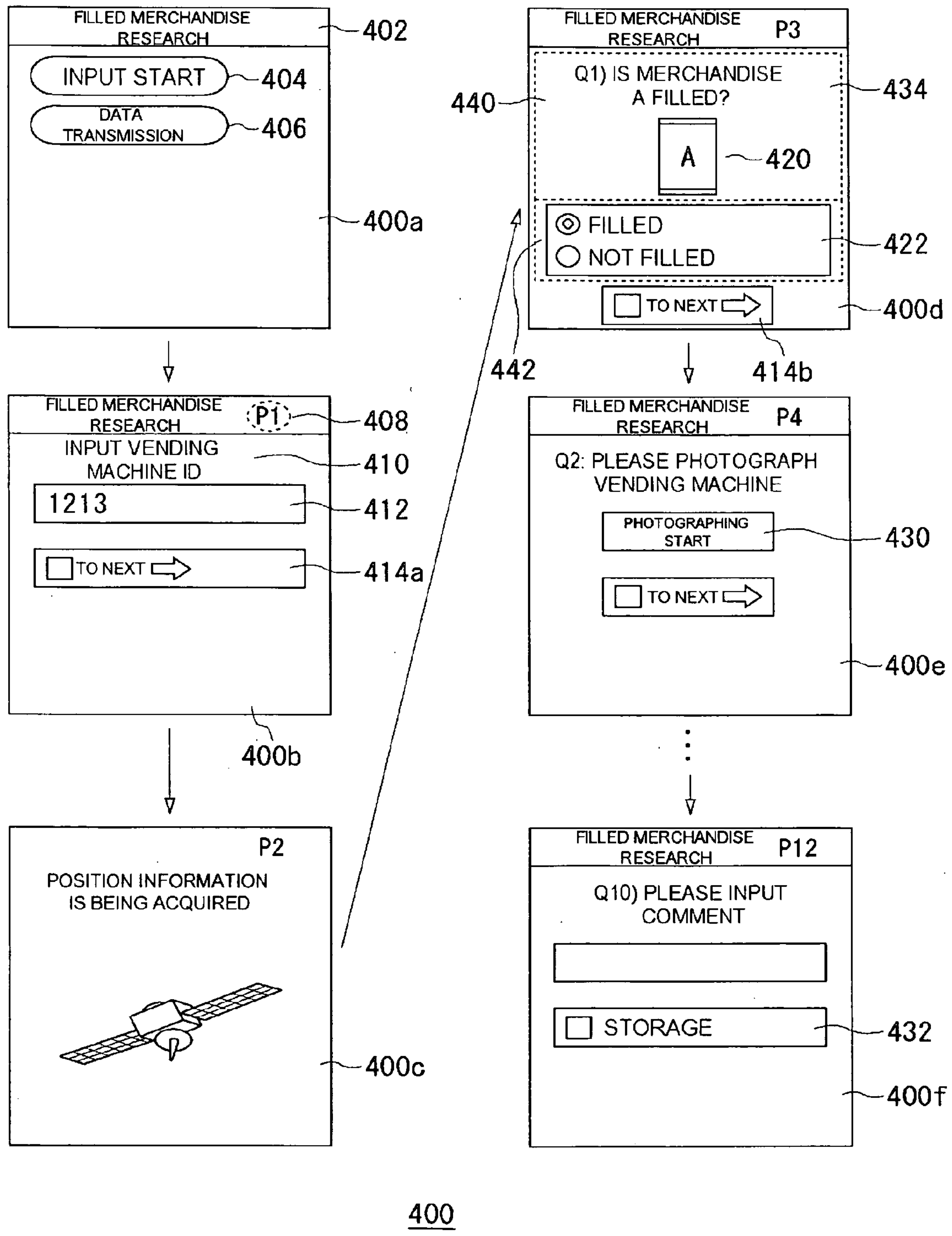

16
300
ANALYZING APPARATUS
PROGRAM CREATING APPARATUS
100
PROGRAM PROVIDING APPARATUS
200
500a
FIRST SETTING APPARATUS
500
500b
SECOND SETTING APPARATUS
12
BASE STATION
14
52
54
50a
50b
50c
50d
50
10

FIG. 2


FILLED MERCHANDISE RESEARCH
402
INPUT START
404
DATA TRANSMISSION
406
400a
FILLED MERCHANDISE RESEARCH
P1
408
INPUT VENDING MACHINE ID
410
1213
412
□ TO NEXT
414a
400b
P2
POSITION INFORMATION IS BEING ACQUIRED
400c
FILLED MERCHANDISE RESEARCH
P3
440
Q1) IS MERCHANDISE A FILLED?
434
A
420
◎ FILLED
○ NOT FILLED
422
□ TO NEXT
400d
442
414b
FILLED MERCHANDISE RESEARCH
P4
Q2: PLEASE PHOTOGRAPH VENDING MACHINE
PHOTOGRAPHING START
430
□ TO NEXT
400e
FILLED MERCHANDISE RESEARCH
P12
Q10) PLEASE INPUT COMMENT
□ STORAGE
432
400f
400

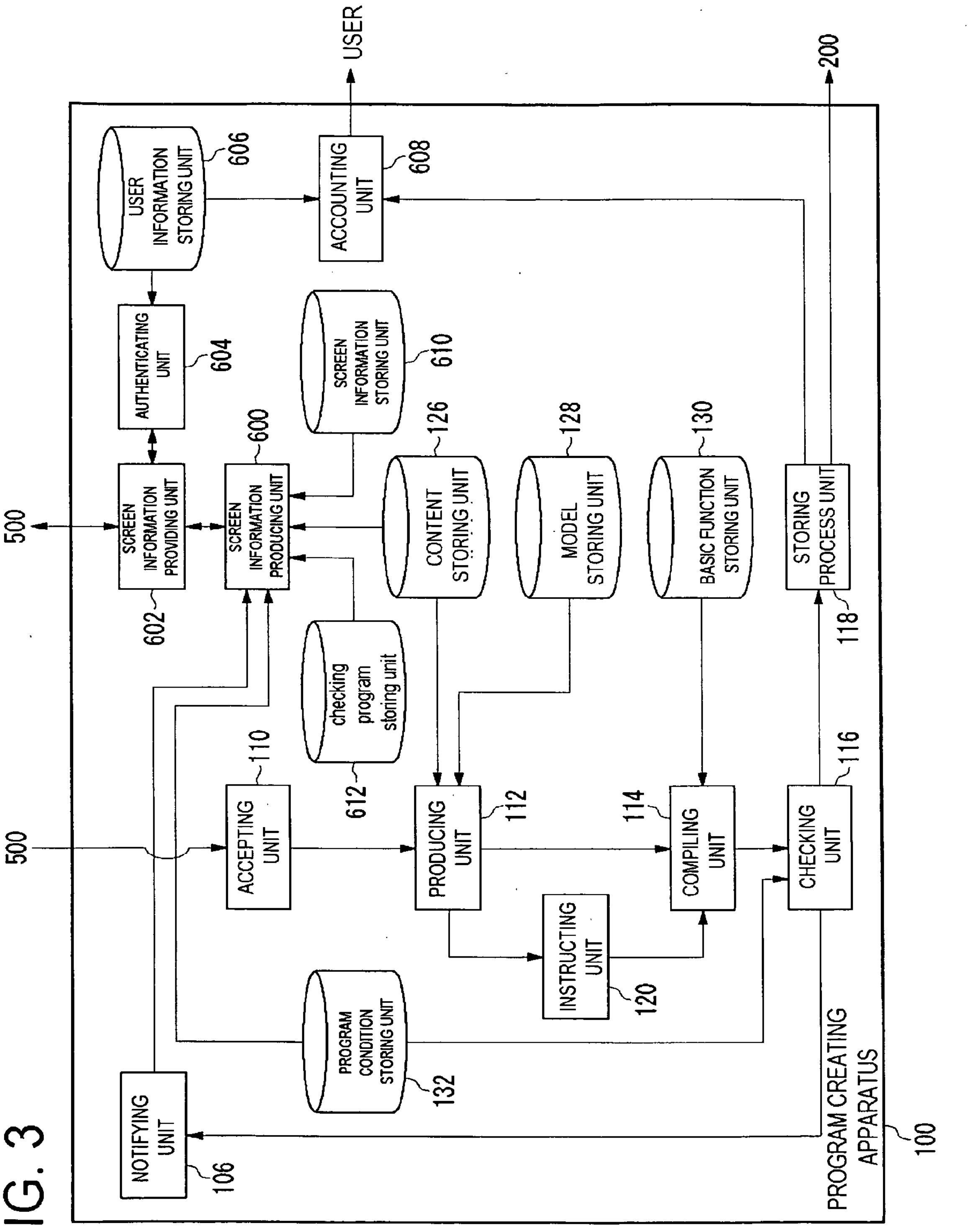

USER
200
500
500
USER INFORMATION STORING UNIT
606
ACCOUNTING UNIT
608
AUTHENTICATING UNIT
604
SCREEN INFORMATION STORING UNIT
610
SCREEN INFORMATION PROVIDING UNIT
602
SCREEN INFORMATION PRODUCING UNIT
600
CONTENT STORING UNIT
126
MODEL STORING UNIT
128
BASIC FUNCTION STORING UNIT
130
STORING PROCESS UNIT
118
checking program storing unit
612
ACCEPTING UNIT
110
PRODUCING UNIT
112
COMPILING UNIT
114
CHECKING UNIT
116
INSTRUCTING UNIT
120
PROGRAM CONDITION STORING UNIT
132
NOTIFYING UNIT
106
PROGRAM CREATING APPARATUS
100

FIG. 3

FIG. 4

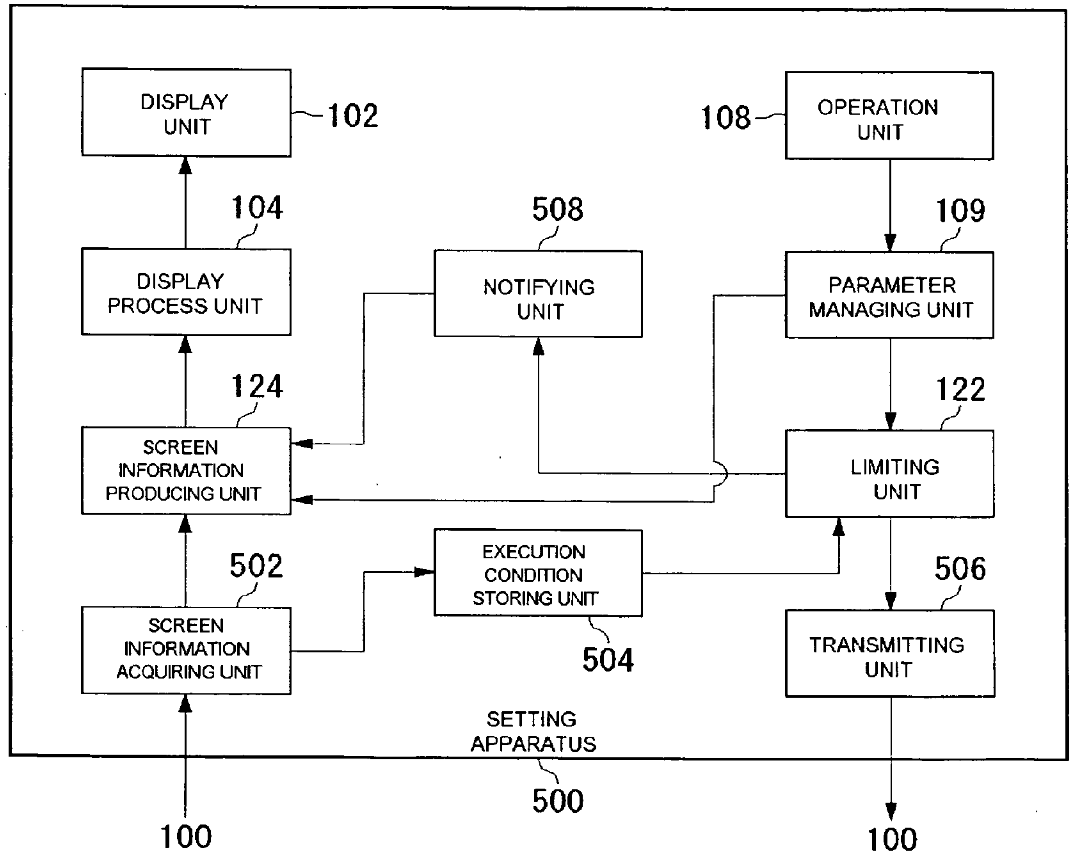
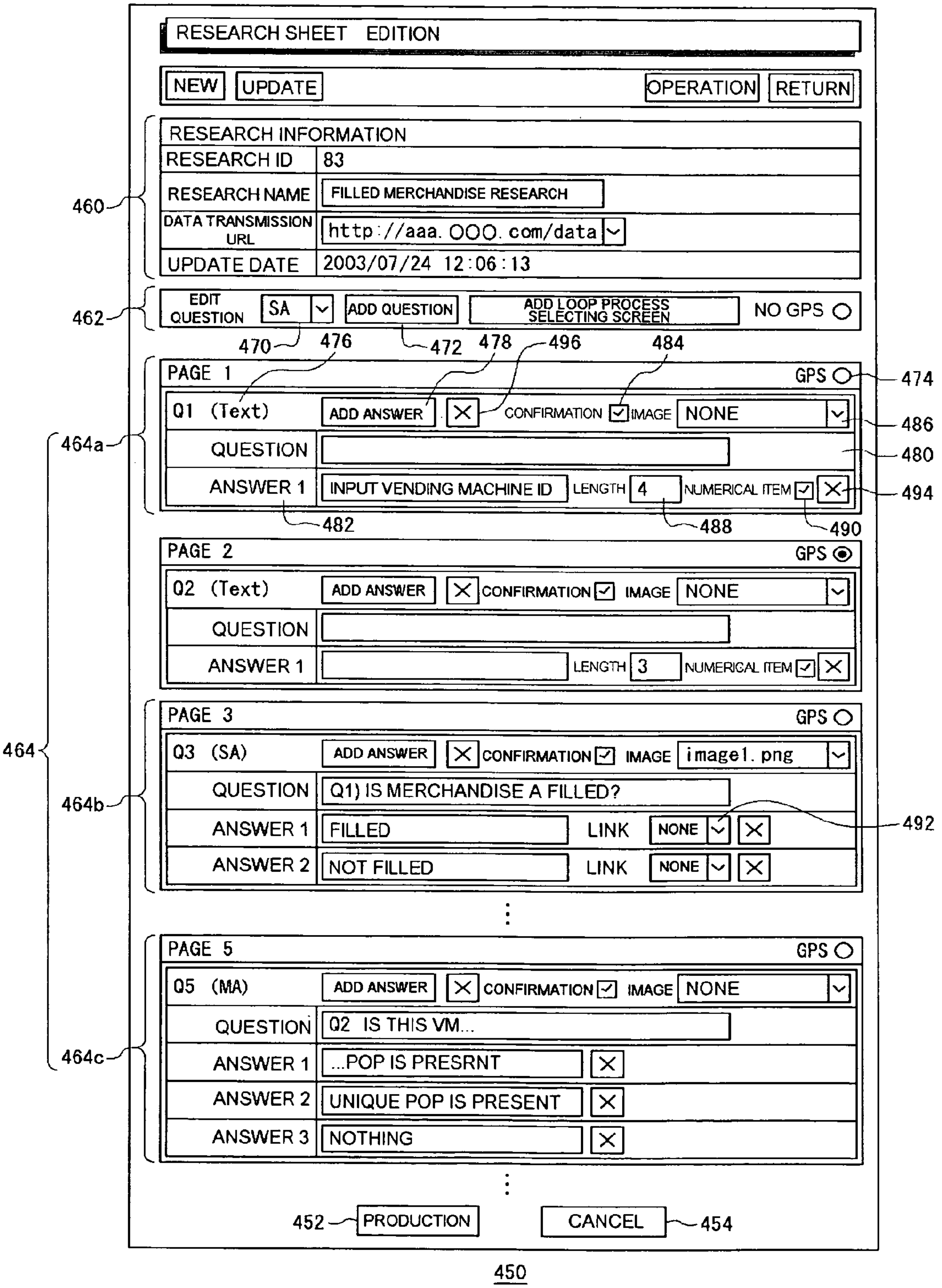

DISPLAY UNIT
102
OPERATION UNIT
108
104
508
109
DISPLAY PROCESS UNIT
NOTIFYING UNIT
PARAMETER MANAGING UNIT
124
122
SCREEN INFORMATION PRODUCING UNIT
LIMITING UNIT
502
EXECUTION CONDITION STORING UNIT
506
SCREEN INFORMATION ACQUIRING UNIT
504
TRANSMITTING UNIT
SETTING APPARATUS
500
100
100

FIG. 5



RESEARCH SHEET EDITION

NEW | UPDATE | OPERATION | RETURN

RESEARCH INFORMATION	
RESEARCH ID	83
RESEARCH NAME	FILLED MERCHANDISE RESEARCH
DATA TRANSMISSION URL	http://aaa.OOO.com/data
UPDATE DATE	2003/07/24 12:06:13

EDIT QUESTION: SA | ADD QUESTION | ADD LOOP PROCESS SELECTING SCREEN | NO GPS ○

PAGE 1 GPS ○

Q1 (Text)	ADD ANSWER ☒ CONFIRMATION ☑ IMAGE NONE
QUESTION	
ANSWER 1	INPUT VENDING MACHINE ID LENGTH 4 NUMERICAL ITEM ☑ ☒

PAGE 2 GPS ●

Q2 (Text)	ADD ANSWER ☒ CONFIRMATION ☑ IMAGE NONE
QUESTION	
ANSWER 1	LENGTH 3 NUMERICAL ITEM ☑ ☒

PAGE 3 GPS ○

Q3 (SA)	ADD ANSWER ☒ CONFIRMATION ☑ IMAGE image1.png
QUESTION	Q1) IS MERCHANDISE A FILLED?
ANSWER 1	FILLED LINK NONE ☒
ANSWER 2	NOT FILLED LINK NONE ☒

⋮

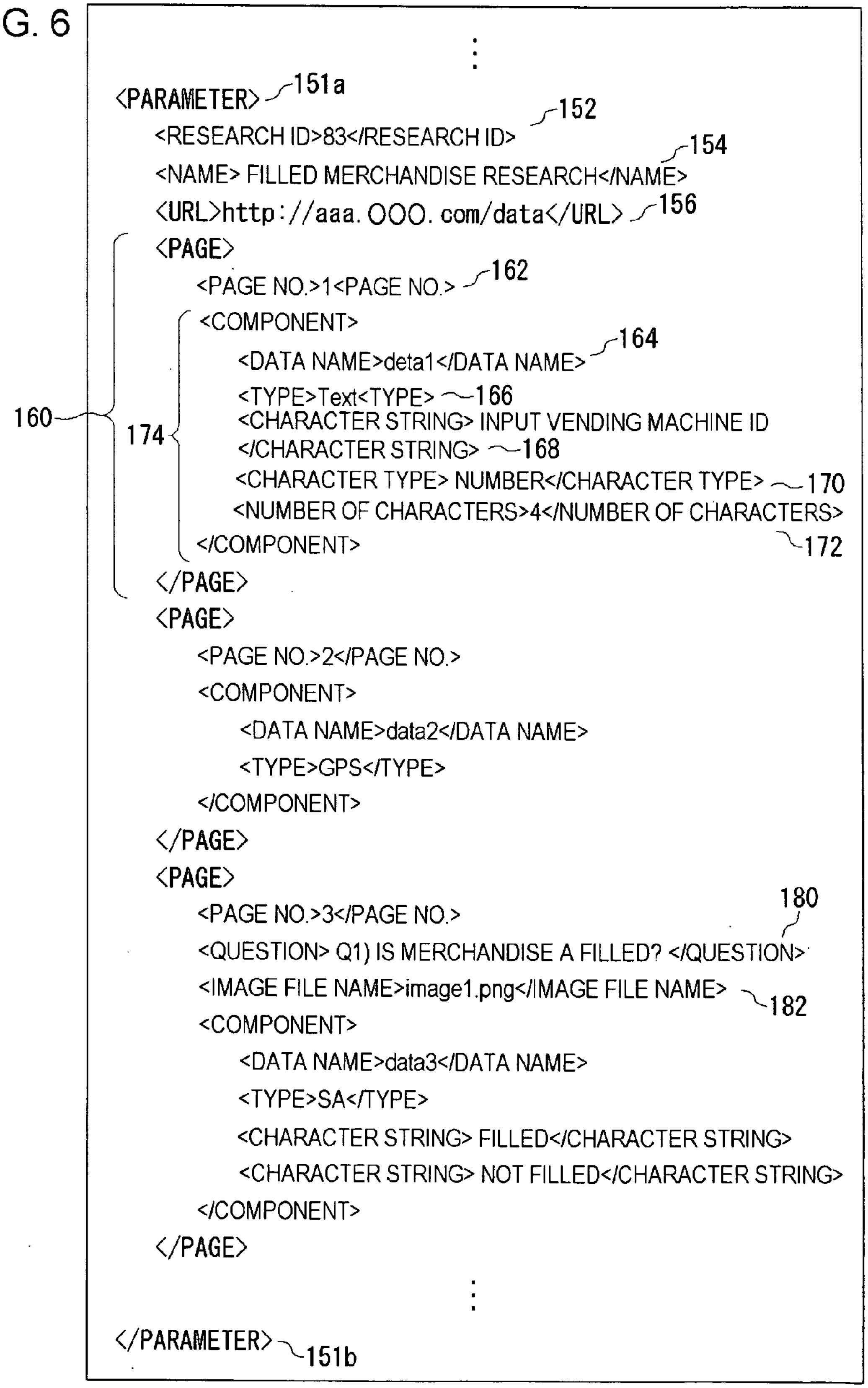
PAGE 5 GPS ○

Q5 (MA)	ADD ANSWER ☒ CONFIRMATION ☑ IMAGE NONE
QUESTION	Q2 IS THIS VM...
ANSWER 1	...POP IS PRESRNT ☒
ANSWER 2	UNIQUE POP IS PRESENT ☒
ANSWER 3	NOTHING ☒

⋮

PRODUCTION | CANCEL

FIG. 6



```
                                  ⋮
<PARAMETER>
    <RESEARCH ID>83</RESEARCH ID>
    <NAME> FILLED MERCHANDISE RESEARCH</NAME>
    <URL>http://aaa.OOO.com/data</URL>
    <PAGE>
        <PAGE NO.>1<PAGE NO.>
        <COMPONENT>
            <DATA NAME>deta1</DATA NAME>
            <TYPE>Text<TYPE>
            <CHARACTER STRING> INPUT VENDING MACHINE ID
            </CHARACTER STRING>
            <CHARACTER TYPE> NUMBER</CHARACTER TYPE>
            <NUMBER OF CHARACTERS>4</NUMBER OF CHARACTERS>
        </COMPONENT>
    </PAGE>
    <PAGE>
        <PAGE NO.>2</PAGE NO.>
        <COMPONENT>
            <DATA NAME>data2</DATA NAME>
            <TYPE>GPS</TYPE>
        </COMPONENT>
    </PAGE>
    <PAGE>
        <PAGE NO.>3</PAGE NO.>
        <QUESTION> Q1) IS MERCHANDISE A FILLED? </QUESTION>
        <IMAGE FILE NAME>image1.png</IMAGE FILE NAME>
        <COMPONENT>
            <DATA NAME>data3</DATA NAME>
            <TYPE>SA</TYPE>
            <CHARACTER STRING> FILLED</CHARACTER STRING>
            <CHARACTER STRING> NOT FILLED</CHARACTER STRING>
        </COMPONENT>
    </PAGE>
                                  ⋮
</PARAMETER>
```

151a
152
154
156
160
162
174
164
166
168
170
172
180
182
151b
150

FIG. 7

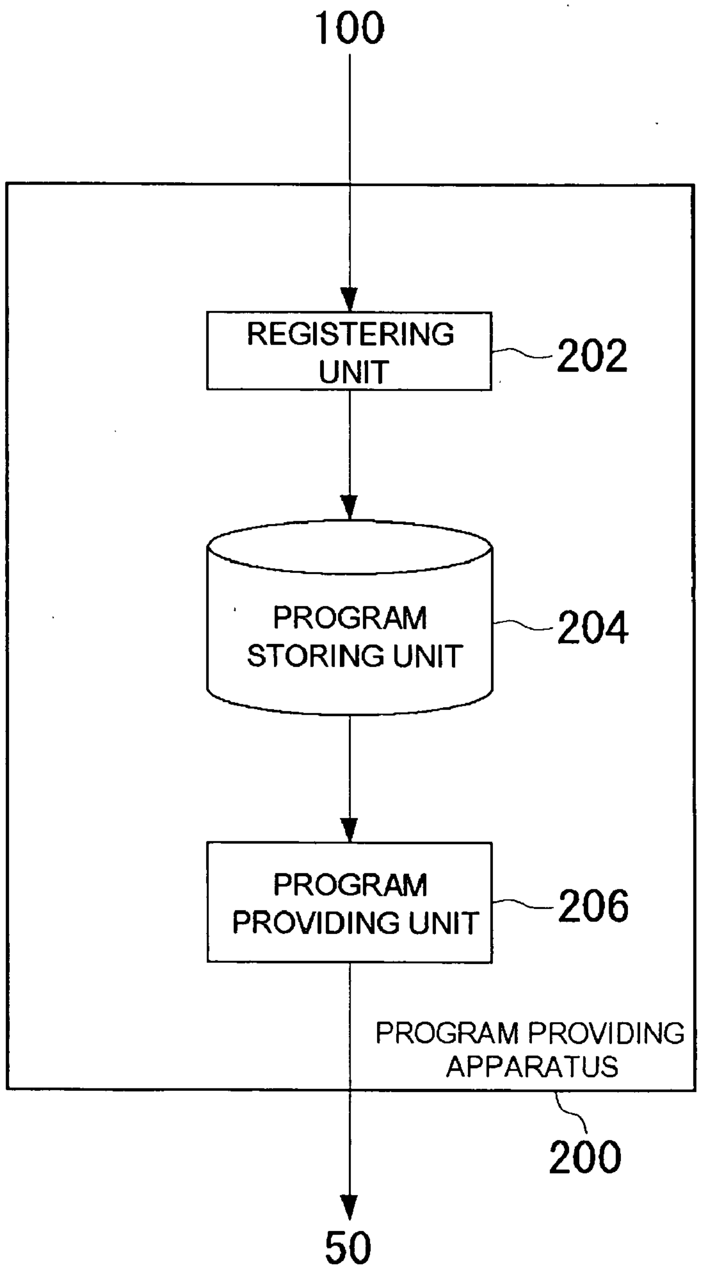

100
REGISTERING UNIT
202
PROGRAM STORING UNIT
204
PROGRAM PROVIDING UNIT
206
PROGRAM PROVIDING APPARATUS
200
50

FIG. 8

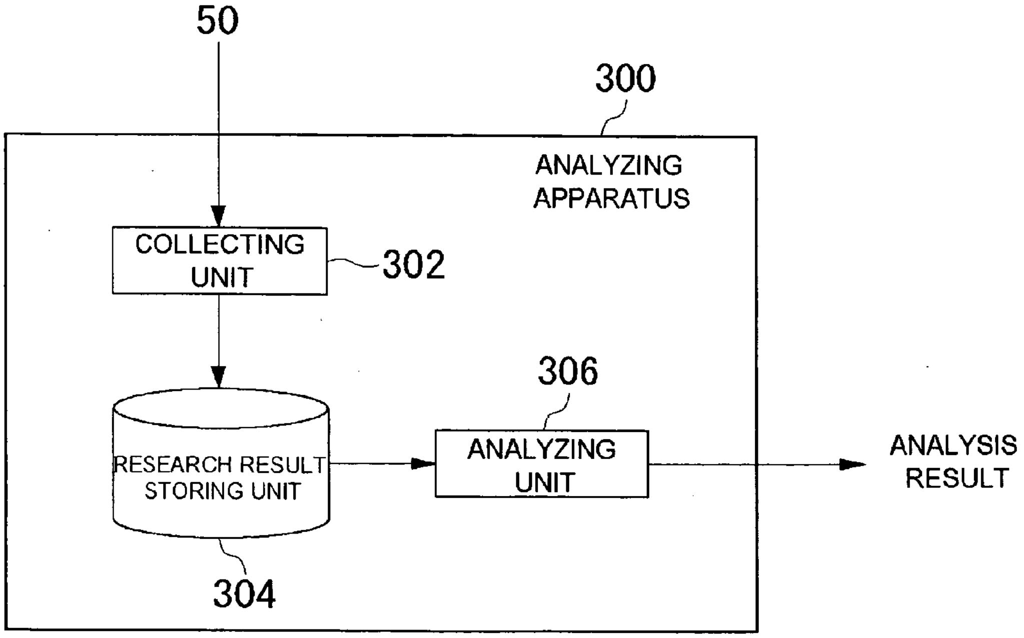
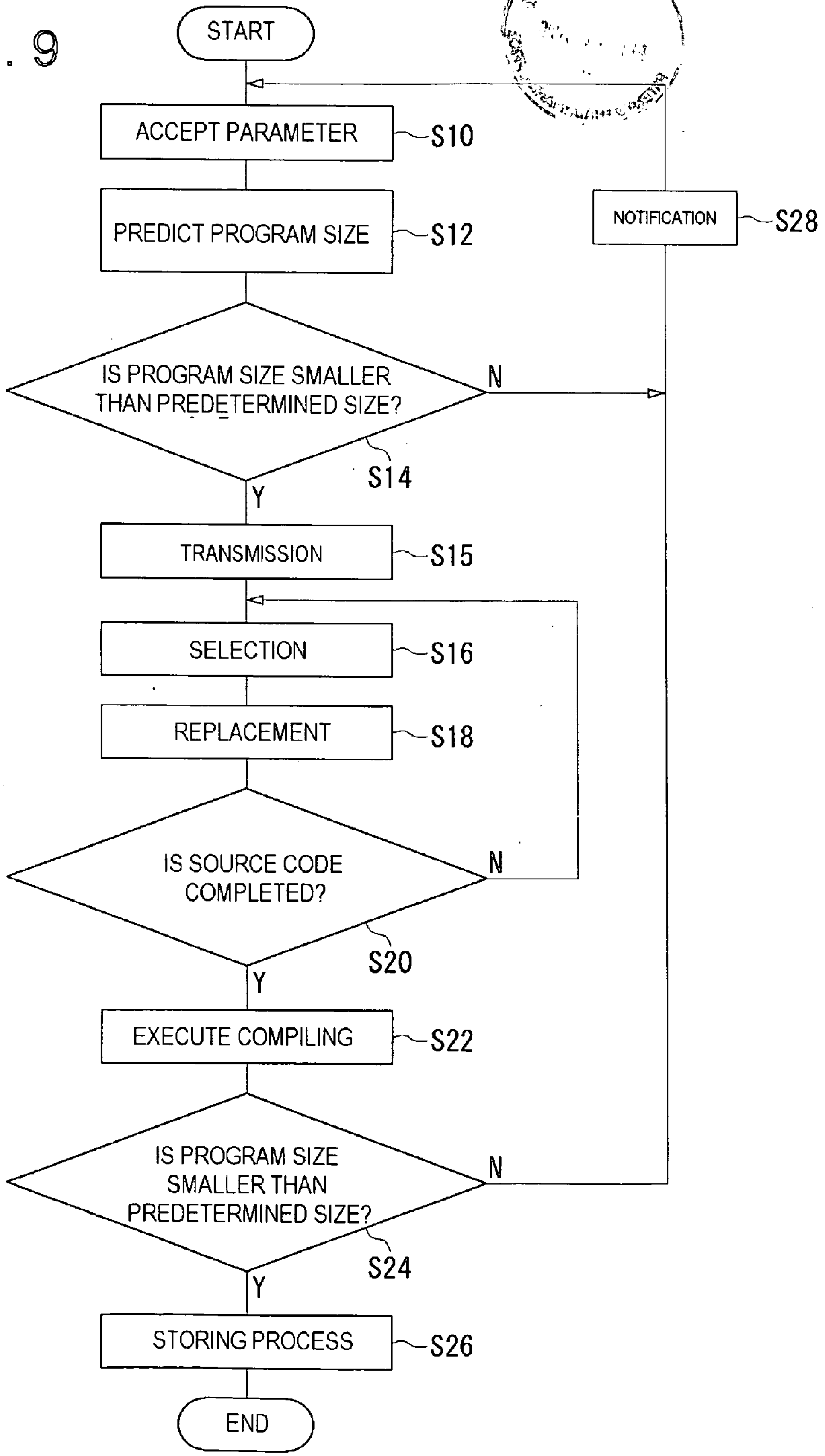

50
300
ANALYZING
APPARATUS
COLLECTING
UNIT
302
306
RESEARCH RESULT
STORING UNIT
ANALYZING
UNIT
ANALYSIS
RESULT
304

FIG. 9


START
ACCEPT PARAMETER
S10
PREDICT PROGRAM SIZE
S12
IS PROGRAM SIZE SMALLER THAN PREDETERMINED SIZE?
S14
N
Y
TRANSMISSION
S15
SELECTION
S16
REPLACEMENT
S18
IS SOURCE CODE COMPLETED?
S20
N
Y
EXECUTE COMPILING
S22
IS PROGRAM SIZE SMALLER THAN PREDETERMINED SIZE?
S24
N
Y
STORING PROCESS
S26
END
NOTIFICATION
S28

PROGRAM CREATING SYSTEM, PROGRAM CREATING PROGRAM, AND PROGRAM CREATING MODULE

TECHNICAL FIELD

[0001] The present invention relates to a technique which creates a program and, more particularly, to a technique which creates a program without causing a user to directly input a source code.

BACKGROUND ART

[0002] Computers are indispensable to daily life nowadays. The computers are mounted on various devices such as terminal devices, mobile telephones, home electric appliances to appropriately control hardware held by these devices and to realize predetermined functions. For example, mobile terminals are used to perform business management in companies, used to analyze experiment results in investigative organizations, and used to transmit and receive electronic mails and to browse web pages on a personal base. In general, in order to realize a predetermined function by using a computer, a program must be executed in a computer.

[0003] In order to create such a program, advanced special knowledge is necessary. For example, a source program is created by a programming language such as C language, C++ language, or JAVA (registered trademark). The source program is compiled by a compiler to create a machine language program which can be executed by a computer. Some technique automatically creates such a source program on the basis of a program specification in a tabular form (see Patent Document 1).

[0004] [Patent Document 1] Japanese Laid-open patent publication NO. 2003-208307

DISCLOSURE OF THE INVENTION

[0005] With spread of computers and diversification of application fields therefor, the number of necessary programs increases every year. Furthermore, a development period for such a program tends to be shortened. However, due to a chronic shortage of programmers, rapid advancement of program technique, rapid advancement of a device for executing a program, and the like, supply of a program is impossible when needed in many cases.

[0006] It is an object of the present invention to provide a technique which shortens a development period for a program, a technique which reduces required work to develop a program, and a technique which easily creates a program.

[0007] An aspect of the present invention is a system which creates a program. The system includes a screen information storing unit which holds screen information that forms an input screen of a parameter to create a first program that realizes a predetermined process, a providing unit which provides the screen information to a setting apparatus connected through a network, an accepting unit which accepts the parameter input on the input screen displayed on the basis of the screen information from the setting apparatus through the network, a producing unit which dynamically produces a source code of the first program on the basis of the parameter, a compiling unit which compiles the source code to create the first program that can be executed by a predetermined terminal device, and an instructing unit which detects that the source code is produced to instruct the compiling unit to compile the source code.

[0008] In this manner, on the basis of the parameter accepted through the network, the source code can be produced. The source code is compiled in response to the completion of the source code to make it possible to automatically create the first program. More specifically, when a user inputs a parameter by using a web browser, producing and compiling of the source are automatically performed to make it possible to create a predetermined program. Since the parameter can be accepted through the network, a plurality of users can use the system, and a user at a remote location can also use the system.

[0009] The system may further include a checking unit which checks that the data size of a first program is smaller than a predetermined size to make it possible to provide the first program to a terminal device when the data size of the first program is smaller than a predetermined size. In this manner, the program producing system can provide the program having a size smaller than the predetermined size to the terminal device. For example, even to a terminal device in which the size of an executable program is limited, a program satisfying the limit can be provided.

[0010] The system may further include a notifying unit which performs notification to urge the setting apparatus to reduce the number of parameters when the data size of the first program is larger than a predetermined size. In this manner, a user can recognize that the data size of the first program is larger than the predetermined size. The program can be created such that the data size of the program becomes smaller than the predetermined size by changing the number of parameters after recognizing that the data size is large.

[0011] The predetermined size may be set for each terminal device using the first program. In this manner, the program can be created depending on execution conditions of the program of each terminal device.

[0012] The system may further include a first program storing unit which stores a first program checked by the checking unit and a providing unit which provides the first program stored in the storing unit to the terminal device. The checking unit may store, when the data size of the first program created by the producing unit is smaller than the predetermined size, the first program in the storing unit. In this manner, a state in which the created program can be provided to the terminal device is achieved.

[0013] The system may further include a second program storing unit which holds a second program that causes the setting apparatus to form a limiting unit that limits the number of parameters such that the size of the first program becomes smaller than the predetermined size, and the providing unit may provide the second program to the setting apparatus together with the screen information. In this manner, since the number of parameters can be controlled on the setting apparatus side, a program can be effectively created.

[0014] Another aspect of the present invention is a system which produces a program. The system includes an acquiring unit which acquires screen information that forms an input screen of a parameter to create a program that realizes a predetermined process through a network, a display process unit which displays the input screen on a display unit on the basis of the screen information, a managing unit which accepts an input of a parameter depending on the input screen to manage the parameter, and a transmitting unit which outputs the parameter managed by the managing unit to a creating apparatus that creates the program through the network. In this manner, the creating apparatus can be used from a plurality of devices connected to the network.

[0015] The system may further include a limiting unit which limits the number of parameters such that the size of the program becomes smaller than a predetermined size, and the transmitting unit may output parameters within the limits imposed by the limiting unit to the creating apparatus. In this manner, since the number of parameters can be controlled before the parameters are transmitted to the producing device, a program can be effectively created.

[0016] The system may further include a notifying unit which performs notification to urge reduction of the number of parameters when the number of parameters must be limited.

[0017] The program includes a component serving as an input interface, the managing unit manages a plurality of parameters to form the component as a group, and the limiting unit may limit the number of parameters in units of groups.

[0018] The limiting unit may predict the data size of the program created by the creating apparatus depending on the parameter managed by the managing unit to determine whether or not the number of parameters must be reduced.

[0019] When the predicted data size of the program is larger than a predetermined size, the limiting unit may determine that the number of parameters must be reduced.

[0020] The limiting unit may compare the number of parameters managed by the managing unit with a predetermined number to determine whether or not the number of parameters must be reduced.

[0021] When the number of parameters managed by the managing unit is larger than a preset number, the limiting unit may determine that the number of parameters must be reduced.

[0022] An aspect obtained by converting arbitrary combinations of the above constituent elements and the expressions of the present invention between a method, a device, a system, a recording medium, a computer program, a module, and the like is also effective as an aspect of the present invention. For example, the present invention includes the following aspects.

[0023] (i) A program creating program causing a computer to realize:

[0024] a screen information storing unit which holds screen information that forms an input screen of a parameter to create a first program that realizes a predetermined process;

[0025] a providing unit which provides said screen information to a setting apparatus connected through a network;

[0026] an accepting unit which accepts the parameter input on the input screen displayed on the basis of said screen information from said setting apparatus through said network;

[0027] a producing unit which dynamically produces a source code of said first program on the basis of said parameter;

[0028] a compiling unit which compiles said source code to create said first program that can be executed by a predetermined terminal device; and

[0029] an instructing unit which detects that said source code is produced to instruct said compiling unit to compile the source code.

[0030] (ii) A program creating module causing a computer to realize:

[0031] a screen information storing unit which holds screen information that forms an input screen of a parameter to create a first program that realizes a predetermined process;

[0032] a providing unit which provides said screen information to a setting apparatus connected through a network;

[0033] an accepting unit which accepts the parameter input on the input screen displayed on the basis of said screen information from said setting apparatus through said network;

[0034] a producing unit which dynamically produces a source code of said first program on the basis of said parameter;

[0035] a compiling unit which compiles said source code to create said first program that can be executed by a predetermined terminal device; and

[0036] an instructing unit which detects that said source code is produced to instruct said compiling unit to compile the source code.

[0037] (iii) A program creating program causing a computer to realize:

[0038] an acquiring unit which acquires screen information that forms an input screen of a parameter to create a program that realizes a predetermined process through a network;

[0039] a display process unit which displays said input screen on a display unit on the basis of said screen information;

[0040] a managing unit which accepts an input of a parameter depending on said input screen to manage the parameter; and

[0041] a transmitting unit which outputs the parameter managed by said managing unit to a creating apparatus that creates said program through said network.

[0042] (iv) A program creating module causing a computer to realize:

[0043] an acquiring unit which acquires screen information that forms an input screen of a parameter to create a program that realizes a predetermined process through a network;

[**0044**] a display process unit which displays said input screen on a display unit on the basis of said screen information;

[**0045**] a managing unit which accepts an input of a parameter depending on said input screen to manage the parameter; and

[**0046**] a transmitting unit which outputs the parameter managed by said managing unit to a creating apparatus that creates said program through said network.

[**0047**] According to the present invention, there can be provided a technique in which a predetermined program is created by producing a source code on the basis of a parameter and compiling the source code, so that the predetermined program can be created without causing a user to directly input the source code.

BRIEF DESCRIPTION OF THE DRAWINGS

[**0048**] The objects described above, other objects, characteristics, and advantages will be apparent with reference to the following preferred embodiment and the following drawings accompanying the embodiment.

[**0049**] FIG. **1** is a block diagram of a researching system according to an embodiment;

[**0050**] FIG. **2** is a diagram showing an example of transition of a work screen displayed on a display unit in FIG. **1**;

[**0051**] FIG. **3** is an internal block diagram of a program creating apparatus in FIG. **1**;

[**0052**] FIG. **4** is an internal block diagram of a setting apparatus in FIG. **1**;

[**0053**] FIG. **5** is a diagram showing an example of an input screen displayed on a display unit in FIG. **4**;

[**0054**] FIG. **6** is a diagram showing an example of a data structure of a parameter file output from a parameter managing unit in FIG. **4** to a limiting unit in FIG. **4**;

[**0055**] FIG. **7** is an internal block diagram of a program providing apparatus in FIG. **1**;

[**0056**] FIG. **8** is an internal block diagram of an analyzing apparatus in FIG. **1**; and

[**0057**] FIG. **9** is an example of a flow chart of a research program creating process executed by the program creating apparatus in FIG. **3** and the setting apparatus in FIG. **4**.

BEST MODE FOR CARRYING OUT THE INVENTION

[**0058**] FIG. **1** is a block diagram of a researching system **10** according to an embodiment. A first terminal device **50***a*, a second terminal device **50***b*, a third terminal device **50***c*, and a fourth terminal device **50***d* (to be simply referred to as "terminal device **50**" hereinafter) are mobile terminals such as mobile telephones and PDAs (Personal Digital Assistants). The terminal device **50** may be a device in which an upper limit of the data size of a program is set as an execution condition of the program and which has a memory size smaller than that of a general terminal. The terminal device **50** has a GPS (Global Positioning System) unit which receives a GPS signal from, for example, a GPS satellite **16** to acquire position information, a CCD camera, a microphone, and the like. The terminal devices **50** are connected to a network **12** through a base station **14** and have functions of communicating with a program providing apparatus **200** and an analyzing apparatus **300**.

[**0059**] A program creating apparatus **100** displays a research content on a display unit **52** of the terminal device **50**, creates a program to accept a research result, and stores the program in the program providing apparatus **200**. A first setting apparatus **500***a* and a second setting apparatus **500***b* (to be simply referred to as "setting apparatus **500**" hereinafter) are connected to the program creating apparatus **100** through a network **12**. The setting apparatus **500** accepts various pieces of information required to create a program in the program creating apparatus **100** from a user and outputs respective parameters to the program creating apparatus **100**. The program creating apparatus **100** produces a program on the basis of the parameters and outputs the program to the program providing apparatus **200**. More specifically, the program creating apparatus **100** provides information (to be simply referred to as "input screen information" hereinafter) to form an input screen, to which parameters required to create the program are input, to the setting apparatus **500**. The setting apparatus **500** forms the input screen on the basis of the input screen information to accept the respective parameters from the user through the screen.

[**0060**] The program providing apparatus **200** provides the program to the terminal device **50** through the network **12**. More specifically, the program creating apparatus **100** provides a program creating function serving as an ASP (Application Service Provider), and is formed so as to be used from the setting apparatus **500** connected to the network **12**.

[**0061**] A researcher executes the program to perform a research on the basis of the research content displayed on the display unit **52**. For example, the researcher moves to a designated point of research while holding the terminal device **50**, and performs the research at the point. The terminal device **50** acquires position information (to be simply referred to as "research position information" hereinafter) of the moving point by using a GPS unit. The acquiring instruction may be performed on the basis of an instruction by the researcher, may be automatically performed by the program within the terminal device **50**, or may be performed on the basis of a signal from outside. The researcher photographs a designated object by using the CCD camera of the terminal device **50** or inputs an item along the research content by using an operation unit **54** such as a key button.

[**0062**] Information to be acquired by the terminal device **50**, except for the research position information, an image, and other information directly input by the researcher is used as not only a research result but also information to determine the reliability of the research result. More specifically, since data obtained from the GPS, the CCD camera, the microphone, and the like held by the terminal device **50** cannot be arbitrarily rewritten by the researcher in general, the data can be used as information which guarantees the reliability of the research result. The terminal device **50** transmits an item input by the researcher, the images obtained by the respective devices, the research position information, and the like to the analyzing apparatus **300** as research results. The analyzing apparatus **300** collects the research results to determine the reliabilities of the research results and then performs a predetermined analysis. In this manner, the analyzing apparatus **300** collects the research results associated with the research position information from a plurality of terminal devices **50**.

[**0063**] FIG. **2** is a diagram showing an example of transition of a work screen **400** displayed on the display unit **52**. A program is executed to display a first work screen **400***a* on the display unit **52** in FIG. **1** and sequentially displays a second work screen **400***b*, a third work screen **400***c*, a fourth work screen **400***d*, a fifth work screen **400***e*, and a sixth work screen **400***f* in the order named. The first work screen **400***a* has a title region **402**, an input start button **404**, and a data transmitting button **406**. The title region **402** is a region to display, for example, a research name or the like, and is displayed on the upper side of the work screen **400**.

[**0064**] The work screen **400** includes a research item designating region **440** to display information representing a research content and a research result input region **442** to which a researcher inputs a research result to the research content. As will be described later in detail, in order to clearly notify the researcher of the research content, the research item designating region **440** includes a research content character string **434** representing, for example, a research content, an appearance of, for example, merchandise related to the research content, and an image **420** to explain a technical term included in the research content. The research result input region **442** includes components such as a text box, a radio button, and a check box which will be described later, and is formed to make it possible to select an answer from, for example, options for the sake of effective and correct answering.

[**0065**] The input start button **404** is a button which accepts an instruction to start a research. The input start button **404** is selected to display a research item on the display unit **52**. In this case, the research content is constituted by a plurality of research items. Upon completion of answering each research item, the data transmitting button **406** is used to transmit the answer as a research result to the analyzing apparatus **300** in FIG. **1**. When the data transmitting button **406** is depressed, that is, selected, the research result is transmitted to the analyzing apparatus **300**.

[**0066**] The second work screen **400***b* is displayed when the input start button **404** is depressed. In the embodiment, a page is set for each research item, and an answer input component suitable for the corresponding research item is arranged. A page number region **408** is a region which displays the page number. An answer content character string **410** is a region which displays a character string representing an answer content to be input to a text input region **412** (to be described later). The text input region **412** is a text box to input an answer. An arbitrary character string can be input to the text input region **412**. A radio button group **422** on the fourth work screen **400***d* is a component to select one answer from options prepared in advance. Although not shown, a check box to select the arbitrary number of answers from the options prepared in advance may be set in the research result input region **442**.

[**0067**] Returning to the second work screen **400***b*, a next screen display button **414***a* is a button to shift to a next research item. The work screen **400** is switched by depressing the button. When the next screen display button **414***a* of the second work screen **400***b* is depressed, the third work screen **400***c* is displayed. At this time, the terminal device **50** acquires position information by using the GPS unit. Upon completion of acquisition of the position information, the fourth work screen **400***d* is displayed. When the research item on the fourth work screen **400***d* is answered to depress a next screen display button **414***b* on the fourth work screen **400***d*, the fifth work screen **400***e* is displayed. In this manner, the researcher inputs answers to a series of research items while sequentially switching the work screens **400**.

[**0068**] A photographing start button **430** on the fifth work screen **400***e* is a button to perform photographing by using the CCD camera held by the terminal device **50** in FIG. **1**. The CCD camera becomes active by depressing the photographing start button **430** to make it possible to perform photographing. In this manner, the program provided by the program providing apparatus **200** in FIG. **1** is coded such that data obtained by using the hardware such as the GPS unit or the CCD camera held by the terminal device **50** can be utilized as a research result.

[**0069**] The sixth work screen **400***f* serving as the final work screen **400** in this drawing has a storing button **432**. The storing button **432** is a button to store an answer input on each work screen **400**. When the storing button **432** is depressed, the data is stored in a storing region of the terminal device **50** as a research result. When the researcher selects the data transmitting button **406** on the first work screen **400***a*, the terminal device **50** transmits the research result, which is being stored, to the analyzing apparatus **300**.

[**0070**] By employing the configuration in which the research result is stored and then transmission is performed as described above, for example, a research can be performed in an out-of-service area where no radio waves reach, and a research result can be transmitted in a service area where radio waves reach. More specifically, since a research can be performed without regarding an incoming signal strength, researches at various places can be performed. The research item and an input interface for an answer can be realized by a program so that an input interface suitable for the research item can be set. For this reason, an artificial mistake such as an input mistake can be prevented, and a prompt research can be performed. Furthermore, since the number of accesses to a server can be made considerably smaller than the number of accesses performed when a research item is provided on a web page, a load on the server can be reduced.

[**0071**] The program to display the work screen **400** may be a program created in a programming language such as JAVA (registered trademark). If the program is created by a programmer in each research, a necessary research cannot be performed at necessary timing due to a problem of the development period. As a result, a prompt research may not be performed. Further, the research items may include an erroneous research item or an erroneous option due to an artificial mistake. There may be a case of refraining from performing a research due to a problem of the development cost for the program.

[**0072**] For this reason, such a program must be automatically created to operate the researching system **10** in FIG. **1**. In general, the program is created by compiling a source code. A programmer produces a source code by using various development tools. However, since advanced special knowledge is required for the operation, ordinary people cannot easily produce the source code.

[0073] The present inventor assumed various researches and studied the input interfaces for the researches. As a result, the present inventor reached a conclusion that input interfaces for each research items were unified to form models so that a source code can be automatically produced by a process of combining the models and a process of replacing character strings in the models with other character strings. The program creating apparatus **100** in FIG. **1** produces a source code according to this method, and automatically creates a program by compiling the source code.

[0074] FIG. **3** is an internal block diagram of the program creating apparatus **100** in FIG. **1**. The respective constituent elements of the program creating apparatus **100** are realized by an arbitrary combination of hardware and software mainly selected from a CPU of an arbitrary computer, a memory, a program which realizes the constituent elements loaded on the memory in the drawing, a storage unit such as a hard disk for storing the program, and a network connection interface. It is apparent to a person skilled in the art that the method and apparatus for realizing the constituent elements include various modifications. The respective drawings to be explained below do not show configurations in units of hardware but show blocks in units of functions.

[0075] A screen information providing unit **602** provides input screen information to the setting apparatus **500**. A screen information storing unit **610** holds various pieces of screen information such as, for example, a model of input screen information. A checking program storing unit **612** holds a checking program to realize a function (to be described later) in the terminal device **50** in FIG. **1**. A screen information producing unit **600** produces input screen information on the basis of data held in the screen information storing unit **610** and the checking program storing unit **612** to supply the input screen information to the screen information providing unit **602**. The screen information providing unit **602** transmits the input screen information to the setting apparatus **500**.

[0076] In the embodiment, the screen information producing unit **600** produces a file in the HTML (Hyper Text Markup Language) format as input screen information. The checking program is a program which is created by an arbitrary program method such as JAVA (registered trademark) or ActiveX and which can be executed on the setting apparatus **500** side. Although will be describe later, the checking program uses the size of a program (to be simply referred to as "maximum program size" hereinafter) which can be executed by the terminal device **50** in FIG. **1** when executing the process. For this reason, the screen information producing unit **600** loads the maximum program size from a program condition storing unit **132** and adds the maximum program size to the input screen information. More specifically, the screen information providing unit **602** transmits the input screen information including the checking program, the maximum program size, and the screen information to form an input screen to the setting apparatus **500**.

[0077] When the input screen information is requested by the setting apparatus **500**, the screen information providing unit **602** requests an authenticating unit **604** to authenticate the setting apparatus **500**. A user information storing unit **606** holds various pieces of information such as a user ID and a password related to a user. The authenticating unit **604** accepts authentication information to be used for authentication such as a user ID or a password of a user who operates, for example, the setting apparatus **500**, and performs authentication with reference to the user information storing unit **606** on the basis of the authentication information.

[0078] When the authentication is passed, the authenticating unit **604** notifies the screen information providing unit **602** of the effect. In response to the notification, the screen information providing unit **602** requests the screen information producing unit **600** to produce input screen information. The screen information providing unit **602** transmits the produced input screen information to the setting apparatus **500**.

[0079] An accepting unit **110** accepts a parameter to create a research program from the setting apparatus **500** and outputs the parameter to a producing unit **112**. The parameter is supplied as, for example, a file (to be simply referred to as "parameter file" hereinafter) in the XML (extensible Markup Language) format. The producing unit **112** produces a source code of a research program on the basis of the parameter file. A model storing unit **128** holds a plurality of types of models to produce the source code. The producing unit **112** combines the models and inserts the parameters included in the parameter file into predetermined positions of the respective models or replaces predetermined character strings in the models with parameters to produce the source code.

[0080] The model storing unit **128** holds the models and information which specifies functions realized by the models, input interfaces, and the like in association with each other. For example, the model storing unit **128** holds program codes to realize these components in the terminal device **50** as models in association with the pieces of type information which specify a type of a component to input an answer.

[0081] In general, in various program languages, functions to realize predetermined processes are prepared as APIs (Application Program Interfaces) in advance. A source code is produced by combining the APIs according to a syntax of each of program languages. The model may be a program code obtained by combining, for example, a plurality of functions or a program code constituted by one function. In short, the model storing unit **128** may only hold component types and models thereof in association with each other.

[0082] Various algorithms to produce source codes on the basis of the parameter file are conceived. Models held by the model storing unit **128** are appropriately prepared depending on the algorithms.

[0083] For example, a model to form the research content display screen **400** having a text box as the research result input region **442** in FIG. **2** includes a character string display function to display a character string and a text box function to display a text box. Predetermined variable identifiers are allocated to, for example, arguments such that respective pieces of information such as a character string, a number, and an image included in the parameter file can be set to arguments of the functions. For example, the producing unit

112 may assign a parameter corresponding to the variable to produce a source code, or may replace the variable with the parameter to reproduce the source code.

[0084] Models to form the research content display screens **400** having a radio box and a check box as the research result input region **442** in FIG. **2** include character display functions, respectively, and include at least one of a radio box function displaying the radio box or a check box function displaying the check box. Program codes included in the models may be appropriately described depending on an algorithm to produce the source code on the basis of the parameter file. In short, the producing unit **112** may specify a function or a model to form the component of the type information on the basis of the type information included in the parameter file so as to set a parameter in the argument of the model.

[0085] When the parameter file includes the image file name column **182** in FIG. **6**, the producing unit **112** loads a corresponding image content from a content storing unit **126** and outputs the image content to a compiling unit **114** together with the source code at predetermined timing. For example, the timing may be the time when the compiling unit **114** (to be described later) performs a compiling process.

[0086] Upon completion of production of the source code, the producing unit **112** outputs the effect as a source code completion notification to an instructing unit **120**. For example, the producing unit **112** sequentially performs processes of conversion into source codes in units of the page configuration information columns **160** of the parameter file. Upon completion of conversion of all the page configuration information columns **160**, the source codes are completed. At this time, that is, when conversion of all the page configuration information columns **160** is finished, the producing unit **112** may output the effect to the instructing unit **120**. The producing unit **112** may sequentially perform processes of converting the parameter start tag **151***a* to the parameter end tag **151***b* into source codes on the basis of the respective parameters. When the parameter end tag **151***b* is converted, the converting processes may be ended, and a source code completion notification may be output to the instructing unit **120**.

[0087] When the instructing unit **120** accepts the source code completion notification from the producing unit **112**, the instructing unit **120** instructs the compiling unit **114** to compile the source code in response to the notification. A basic function storing unit **130** holds various files required for compiling. The compiling unit **114** converts the source code into an object code by using the file held in the basic function storing unit **130** to create a research program file.

[0088] A checking unit **116** checks that the research program created by the compiling unit **114** can be executed in the terminal device **50** in FIG. **1**. In general, the terminal device **50** in FIG. **1** has a memory capacity smaller than that of, for example, a desktop computer or the like and has CPU performance inferior to that of the desktop computer or the like. For this reason, the maximum program size of an executable program is determined. When the size of the created research program is smaller than the maximum program size, the checking unit **116** determines that the program can be executed, and outputs the research program to a storing process unit **118**. The storing process unit **118** outputs the research program to the program providing apparatus **200** to make it possible to distribute the research program.

[0089] An accounting unit **608** uses the program creating apparatus **100** to manage a utility rate in association with a user who created a distributable program.

[0090] On the other hand, when the size of the created research program is larger than the maximum program size, the checking unit **116** outputs information representing that the program size is so large that the program cannot be executed in the terminal device **50** to a notifying unit **106**. On the basis of the information, the notifying unit **106** notifies a display process unit **104** that the program cannot be executed in the terminal device **50** because the program size exceeds the maximum program size, and outputs a message that urges the screen information producing unit **600** to reduce the number of research items. In this manner, the screen information producing unit **600** produces screen information to transmit the message to the setting apparatus **500** and outputs the screen information to the screen information providing unit **602**. The screen information providing unit **602** transmits the screen information to the setting apparatus **500**. In this manner, a message to inform that the program size exceeds the maximum program size and that the number of research items must be reduced to complete the program is displayed on the setting apparatus **500**.

[0091] In this manner, the checking of the program size of the research program avoids an event where the research program can not be executed because the program size of the research program is larger than the maximum program size of the terminal device **50** in FIG. **1** that uses the research program.

[0092] The program condition storing unit **132** holds the maximum program size of the terminal device **50** in association with information (to be simply referred to as "terminal information" hereinafter) which specifies the terminal device **50** in FIG. **1**. The checking unit **116** specifies the maximum program size to perform the checking operation with reference to the program condition storing unit **132**. For example, the terminal information may be included in the parameter file.

[0093] A user simply inputs a research item to an input screen displayed on the setting apparatus **500** so as to produce a source code and to dynamically compile the source code, so that a research program can be created in the program creating apparatus **100**

[0094] FIG. **4** is an internal block diagram of the setting apparatus **500** in FIG. **1**. A screen information acquiring unit **502** acquires input screen information to form, on the display unit **102**, an input screen to input various pieces of information required to form the above-described program for research (to be simply referred to as "research program" hereinafter) from the program creating apparatus **100**. The screen information acquiring unit **502** stores the maximum program size included in the input screen information in an execution condition storing unit **504** to start the checking program. When the checking program is started, a limiting unit **122** (to be described later) and a notifying unit **508** (to be described late) are formed.

[0095] A screen information producing unit **124** produces screen information on the basis of the input screen information or notification from the notifying unit **508** (to be described later) and outputs the screen information to the display process unit **104**. The display process unit **104** displays the input screen on the display unit **102** on the basis of the screen information.

[**0096**] An operation unit **108** is an input device such as a keyboard or a mouse, and accepts an operation from a user to output various pieces of information for the input screen to a parameter managing unit **109**. The parameter managing unit **109** manages the input pieces of information as parameters in association with parameter names or the like. The screen information producing unit **124** loads the parameters managed by the parameter managing unit **109** and reflects a newly input parameter in the input screen. The parameter managing unit **109** outputs a parameter, which is being managed, as a parameter file to the program creating apparatus **100** at predetermined timing.

[**0097**] The limiting unit **122** limits the number of research items included in the research program on the basis of the parameters included in the parameter file. More specifically, on the basis of the program size of the research program finally created by the checking unit **116** in FIG. **3**, the checking unit **116** checks whether or not the research program can be used in the terminal device **50**, whereas the limiting unit **122** predicts whether or not the research program can be used in the terminal device **50** before the source code is produced by the program creating apparatus **100** in FIG. **3**. When the predicted program size exceeds the maximum program size, the limiting unit **122** instructs the notifying unit **508** to notify that the number of research items is to be reduced. Since it is predicted depending on the instruction that the program size exceeds the maximum program size, the notifying unit **508** displays a message that urges reduction of the number of research items on the display unit **102**. In this manner, a waste source code can be avoided from being produced and compiled. Since the process in the limiting unit **122** is performed on the setting apparatus **500** side, the program creating apparatus **100** is not burdened.

[**0098**] The limiting unit **122** loads the maximum program size depending on the terminal device **50** in FIG. **1** from the execution condition storing unit **504**. The limiting unit **122** predicts the program size of the research program on the basis of the parameters included in, for example, the parameter file. For this reason, the limiting unit **122** holds a table in which parameter names, that is, the types of parameters are associated with program sizes. The limiting unit **122** may specify a program size for each parameter included in the parameter file with reference to the table, and may estimate the size of the research program by, for example, adding the program sizes.

[**0099**] When the limiting unit **122** accepts the parameter file from the parameter managing unit **109**, the limiting unit **122** determines whether or not the number of research items must be reduced on the basis of the parameter file. When the number of research items need not be reduced, the limiting unit **122** outputs the parameter file to a transmitting unit **506**. The transmitting unit **506** outputs the parameter file to the program creating apparatus **100**.

[**0100**] FIG. **5** is a diagram showing an example of an input screen **450** displayed on the display unit **102** in FIG. **4**. A various-information input region **460** is a region to input various pieces of information required to cause the research program to realize the above-described functions. An "research ID" is information to identify a research program. When, for example, a research result is transmitted to the analyzing apparatus **300** in FIG. **1**, the research ID is transmitted in associated with the research result. The "research name" is a name for each research and is displayed in the title region **402** in FIG. **2**. A "data transmission URL" is a region to input information to specify the analyzing apparatus **300** in FIG. **1** serving as a destination of the research result on the network **12**. As the "data transmission URL", for example the URL (Uniform Resource Locator) of the analyzing apparatus **300** is set.

[**0101**] The component adding operation button group **462** is used when a research item is added. A type selection component **470** is a component to designate a type of a component used to input an answer of a research item to be added. As types of components which can be selected by the type selection component **470**, a radio button (expressed as "SA" in FIG. **4**) with which one answer can be selected from, for example, a plurality of options, a check box (expressed as "MA" in FIG. **4**) with which the arbitrary number of answers can be selected from the plurality of options, and a text box (expressed as "Text" in FIG. **4**) to input a text are present. An arbitrary type is selected from the type selection component **470**, and a component adding button **472** is depressed, so that a component setting region **464** depending on a selected type is added.

[**0102**] Each component setting region **464** is constituted by components such as a text box and a check box such that information required to form the research item designating region **440** in FIG. **2** and information required to form the research result input region **442** in FIG. **2** can be input.

[**0103**] A first component setting region **464***a* is added when "text box" is selected as a component type. The type of the component is displayed in a type display region **476**. In the first component setting region **464***a*, a question input region **480** and an image selection component **486** are arranged in order to form the research item designating region **440** in FIG. **2**. An answer input region **482**, a maximum-number-of-characters designating region **488**, and an input character type designating box **490** are arranged in order to form the research result input region **442** in FIG. **2**.

[**0104**] The question input region **480** is, for example, a region to input a document for instructing a matter to be researched by a researcher. A character string input thereto is displayed as the research content character string **434** in FIG. **2**. The image selection component **486** is a component to select an image content displayed as the image **420** in FIG. **2** and is formed to make it possible to select an arbitrary image content from, for example, a list. The content storing unit **126** in FIG. **3** stores an image content. When the image selection component **486** is selected, the screen information acquiring unit **502** acquires a list of image contents held by the content storing unit **126** from the program creating apparatus **100**. The screen information producing unit **124** may form the image selection component **486** by using the list.

[**0105**] The answer input region **482** is a region to input a character string to be displayed around the text box. The character string is arranged on any one of the upper side, the lower side, the left side, and the right side of the text box to input an answer. The maximum-number-of-characters designating region **488** is a region to set the upper limit of the number of characters which can be input to the text box. The input character type designating box **490** is a check box to designate a character type which can be input to the text box. In the embodiment, the check box is checked so that only a number can be input, and the check box is unchecked so that an arbitrary character type such as a katakana character, a kanji character, an alphabet, a number, or the like can be input. The answer input region **482**, the maximum-number-of-characters designating region **488**, and the input character type designating box **490** are associated with each other.

[0106] In FIG. **5**, "input vending machine ID" is filled in the answer input region **482**, "4" is filled in the maximum-number-of-characters designating region **488**, and the input character type designating box **490** is checked. In this manner, the second work screen **400***b* in FIG. **2** is formed. More specifically, "input vending machine ID" is displayed as the answer content character string **410** above the text input region **412**. Only a number can be input to the text input region **412**, and the maximum number of characters is set at four.

[0107] Returning to FIG. **5**, the answer input region **482** is added by depressing an answer adding button **478**. More specifically, when a plurality of text boxes are arranged as the research result input region **442** in FIG. **2**, the answer adding button **478** is depressed a desired number of times. In this manner, the answer input regions **482**, the number of which corresponds to the number of times of depression of the answer adding button **478**, are newly added to the first component setting region **464***a*. In each of the added answer input regions **482**, character strings can be independently set. As a matter of course, the maximum-number-of-characters designating region **488** and the input character type designating box **490** associated with each answer input region **482** can be independently set. Furthermore, the answer input regions **482** for a radio button and a check box are added by depressing the answer adding buttons **478** in a second component setting region **464***b* (to be described later) and a third component setting region **464***c* (to be described later), respectively.

[0108] An answer deletion component **494** is a component to delete the answer input region **482**. The answer deletion component **494** is depressed to delete the corresponding answer input region **482**.

[0109] A radio button **474** is a component to designate whether or not position information is associated with a research result, that is, the GPS unit held by the terminal device **50** in FIG. **1** is used. When the radio button **474** is checked, the position information is associated with the research result. In the embodiment, when the radio button **474** in any one of the component setting regions **464** is checked, a research program is executed. Thereafter, the position information is acquired at any timing.

[0110] A research item deletion component **496** is a component to delete a research item. The research item deletion component **496** is depressed to delete the component setting region **464** of the corresponding research item.

[0111] The second component setting region **464***b* is added when a "radio button" is selected as a component type. A character string input to the answer input region **482** of the second component setting region **464***b* is displayed in association with each radio button. More specifically, each option is input to each answer input region **482**. A link designating region **492** is a component not to sequentially display research items but to designate whether or not another designated research item is displayed as a link when the answer is selected. For example, the link designating region **492** is formed to make it possible to select an arbitrary research item from the list of research items. When the radio button is selected, a screen of the research item designated as a link is displayed.

[0112] The third component setting region **464***c* is added when a "check box" is selected as a component type. A character string input to the answer input region **482** of the third component setting region **464***c* is displayed in association with each check box. More specifically, each option is input to each answer input region **482**.

[0113] Such a display process is realized such that information to form the input screen **450** is rewritten as needed by the screen information producing unit **124** on the basis of a parameter updated depending on an operation by a user on the operation unit **108** in FIG. **3**.

[0114] A producing button **452** is a button to instruct that a source code is produced by using various pieces of information input to the input screen **450**. A cancel button **454** is a button to cancel inputting to the input screen **450**. When the producing button **452** is depressed, the parameter managing unit **109** in FIG. **4** outputs a parameter under control to the limiting unit **122**. Although various output modes of parameters are present, in the embodiment, the parameter managing unit **109** outputs respective parameters to the limiting unit **122** as files (to be simply referred to as "parameter files" hereinafter) in the XML (extensible Markup Language) format.

[0115] FIG. **6** is a diagram showing an example of a data structure of a parameter file output to the limiting unit **122** by the parameter managing unit **109** in FIG. **4**. All parameters to create one research program are held between a parameter start tag **151***a* representing the start of the parameters and a parameter end tag **151***b* representing the and of the parameters. Each parameter is held between tags representing names of parameters. A research ID column **152**, a name column **154**, and a URL column **156** respectively hold an "research ID", an "research name", and a "data transmission URL", all of which are input to the various-information input regions **460** in FIG. **5**. Various pieces of information input to the component setting region **464** in FIG. **5** are held between tags in a page configuration information column **160**. In the embodiment, one page, that is, information to form one work screen **400** in FIG. **2** is included in one page configuration information column **160**.

[0116] A page number column **162** holds page identifying information which identifies a page, and may hold, for example, an order of pages to be displayed. More specifically, a producing unit **112** (to be described later) in FIG. **3** determines an order of pages to be displayed on the basis of the page identifying information, and produces a source code so as to display the respective pages in the order. When the component adding button **472** in FIG. **5** is operated to add the component setting region **464**, the page identifying information is allocated in the component setting region **464** in, for example, an ascending order by the parameter managing unit **109** in FIG. **4**.

[**0117**] A component column **174** holds various pieces of information to form the research result input region **442** in FIG. **2**. A data name column **164** holds a data name which specifies an answer input or selected by the component. When a research result is transmitted to the analyzing apparatus **300**, the terminal device **50** in FIG. **1** transmits an answer in association with the data name. As another example, when a research result is transmitted in a CSV format, the data name need not be set.

[**0118**] A type column **166**, for example, holds type information which specifies types of components such as a text (expressed as "Text" in FIG. **5**), a radio box (expressed as "SA" in FIG. **5**), and a check box (expressed as "MA" in FIG. **5**). Information which identifies a component to control hardware of the terminal device **50** such as a GPS component which acquires position information and a photographing component which photographs an image by using a CCD camera is also held in the type column **166** as type information.

[**0119**] A character string column **168** holds a character string input to the answer input region **482** in FIG. **5**. A character type column **170** holds information which specifies a type of a character which can be input. In the embodiment, "number" is set when the input character type designating box **490** in FIG. **5** is checked, and information representing a type of an arbitrary character is set when the input character type designating box **490** is not checked. A number-of-character column **172** holds a number input to the maximum-number-of-characters designating region **488** in FIG. **5**.

[**0120**] When a text is held in the type column **166**, the component column **174** includes the character type column **170** and the number-of-character column **172** to form a text box. When "SA" representing a radio box or "MA" representing a check box is held in the type column **166**, the component column **174** includes the character string columns **168**, the number of which corresponds to the number of branches of options, in order to form a text box or a check box.

[**0121**] A question column **180** holds a character string input to the question input region **480** in FIG. **5**. An image file name column **182** holds a file name of an image file selected by the image selection component **486** in FIG. **5**. In another example, the image file name column **182** may hold a path or a URL representing a storing place of the image file.

[**0122**] The parameter managing unit **109** in FIG. **4** outputs a parameter file, in which the respective parameters to form the work screen **400** in FIG. **2** are held while being grouped for each research item, that is, for each page configuration information column **160**, to the limiting unit **122** in FIG. **4**.

[**0123**] The limiting unit **122** may compare the number of page configuration information columns **160** in FIG. **6** included in the parameter file with the upper limit (to be simply referred to as the "maximum number of items" hereinafter) of the number of preset research items to limit the number of research items. For example, the limiting unit **122** may notify the notifying unit **106** that the number of research items is to be reduced when the number of page configuration information columns **160** in FIG. **6** included in the parameter file is larger than the maximum number of items.

[**0124**] FIG. **7** is an internal block diagram of the program providing apparatus **200** in FIG. **1**. A registering unit **202** accepts the research program from the program creating apparatus **100**. The registering unit **202** stores the accepted research program in a program storing unit **204**. A program providing unit **206** provides the research program stored in the program storing unit **204** in response to a request from the terminal device **50**. When the program providing unit **206** provides the research program, the program providing unit **206** authenticates a researcher by using identification information or the like uniquely allocated to, for example, the terminal device **50**. When the authentication is passed, the program providing unit **206** may provide the research program to the terminal device **50**.

[**0125**] FIG. **8** is an internal block diagram of the analyzing apparatus **300** in FIG. **1**. A collecting unit **302** accepts a research result from the terminal device **50**. The collecting unit **302** collects the research result from the terminal device **50** in, for example, a CSV format, a format associated with a parameter name representing a research item. The collecting unit **302** stores the research result in a research result storing unit **304**. An analyzing unit **306** performs a predetermined analysis such as statistical counting to output an analysis result on the basis of a research result stored in the research result storing unit **304**.

[**0126**] FIG. **9** is an example of a flow chart of a research program creating process in the program creating apparatus **100** in FIG. **3** and the setting apparatus **500** in FIG. **4**. The limiting unit **122** in FIG. **4** accepts a parameter file from the parameter managing unit **109** (S**10**), and predicts the program size of the research program on the basis of a parameter included in the parameter file (S**12**). The limiting unit **122** in FIG. **4** determines whether or not the predicted program size is smaller than the preset maximum program size (S**14**). When the predicted program size is larger than the maximum program size (N in S**14**), the notifying unit **508** in FIG. **4** notifies that the number of research items is to be reduced (S**28**).

[**0127**] When the predicted program size is smaller than the maximum program size in S**14** (Y in S**14**), the transmitting unit **506** in FIG. **4** transmits the parameter file to the program creating apparatus **100** (S**15**). The producing unit **112** in FIG. **3** selects a model from the model storing unit **128** in FIG. **3** on the basis of the parameter included in the parameter file (S**16**) and replaces a predetermined argument in the model with the parameter in the parameter file (S**18**).

[**0128**] The producing unit **112** determines whether or not the source code is completed (S**20**). When the source code is not completed (N in S**20**), the flow returns to S**16**. When the source code is completed (Y in S**20**), the producing unit **112** outputs the effect to the instructing unit **120** in FIG. **3**. The instructing unit **120** instructs the compiling unit **114** in FIG. **3** to compile the source code. In this manner, the compiling unit **114** executes compiling (S**22**).

[**0129**] After the research program is completed, the compiling unit **114** outputs the research program to the checking unit **116** in FIG. **3**. The checking unit **116** determines whether or not the program size of the research program is smaller than the maximum program size (S**24**). When the program size is larger than the maximum program size (N in S**24**), the notifying unit **106** notifies that the number of research items is to be reduced (S**28**). When the program size is smaller than the maximum program size (Y in S**24**), the checking unit **116** outputs the research program to the storing process unit **118** in FIG. **3**, and the storing process unit **118** outputs the research program to the program providing apparatus **200** in FIG. **1** to make it possible to provide the research program to the terminal device **50** in FIG. **1** (S**26**).

[0130] The functions of the program creating apparatus **100** are described by using a research program as an example. However, the program creating apparatus **100** may create not only a research program but also various programs for, for example, a questionnaire, a quiz, and the like.

[0131] The present invention has been described with reference to the embodiment. The embodiment is an exemplification, and it will be understood by a person skilled in the art that various modifications can be effected by combining the respective constituent elements and the respective processing processes and that such modifications fall within the scope of the invention.

1. A program creating system comprising:

a screen information storing unit which holds screen information that forms an input screen of a parameter to create a first program that realizes a predetermined process;

a providing unit which provides said screen information to a setting apparatus connected through a network;

an accepting unit which accepts the parameter input on the input screen displayed on the basis of said screen information from said setting apparatus through said network;

a producing unit which dynamically produces a source code of said first program on the basis of said parameter;

a compiling unit which compiles said source code to create said first program that can be executed by a predetermined terminal device; and

an instructing unit which detects that said source code is produced to instruct said compiling unit to compile the source code.

2. The program creating system as set forth in claim 1, further comprising

a checking unit which checks whether or not the data size of said first program is smaller than a predetermined size to make it possible to provide said first program to said terminal device when the data size of said first program is smaller than a predetermined size.

3. The program creating system as set forth in claim 2, further comprising

a notifying unit which performs notification to urge said setting apparatus to reduce the number of said parameters when the data size of said first program is larger than said predetermined size.

4. The program creating system as set forth in claim 2,

wherein said predetermined size is set for each terminal device which uses said first program.

5. The program creating system as set forth in claim 2, further comprising:

a first program storing unit which stores a first program checked by said checking unit; and

a providing unit which provides the first program stored in said storing unit to said terminal device,

wherein said checking unit stores, when the data size of the first program created by said producing unit is smaller than the predetermined size, the first program in said storing unit.

6. The program creating system as set forth in claim 1, further comprising

a second program storing unit which holds a second program that causes said setting apparatus to form a limiting unit that limits the number of said parameters such that the size of said first program becomes smaller than said predetermined size,

wherein said providing unit provides said second program to said setting apparatus together with said screen information.

7. A program creating system comprising:

an acquiring unit which acquires screen information that forms an input screen of a parameter to create a program that realizes a predetermined process through a network;

a display process unit which displays said input screen on a display unit on the basis of said screen information;

a managing unit which accepts an input of a parameter depending on said input screen to manage the parameter; and

a transmitting unit which outputs the parameter managed by said managing unit to a creating apparatus that creates said program through said network.

8. The program creating system as set forth in claim 7, further comprising

a limiting unit which limits the number of said parameters such that the size of said program becomes smaller than a predetermined size,

wherein said transmitting unit outputs parameters within the limits imposed by said limiting unit to said creating apparatus.

9. The program creating system as set forth in claim 8, further comprising

a notifying unit which performs notification to urge reduction of the number of said parameters when the number of said parameters must be limited.

10. The program creating system as set forth in claim 8,

wherein said program includes a component serving as an input interface,

said managing unit manages a plurality of parameters to form said component as a group, and

said limiting unit limits the number of said parameters in units of groups.

11. The program creating system as set forth in claim 9,

wherein said limiting unit predicts the data size of a program created by said creating apparatus depending on the parameter managed by said managing unit to determine whether or not the number of said parameters must be reduced.

12. The program creating system as set forth in claim 11,

wherein when the predicted data size of the program is larger than said predetermined size, said limiting unit determines that the number of said parameters must be reduced.

13. The program creating system as set forth in claim 9,

wherein said limiting unit compares the number of parameters managed by said managing unit with a predetermined number to determine whether or not the number of said parameters must be reduced.

14. The program creating system as set forth in claim 13,

wherein when the number of parameters managed by said managing unit is larger than said predetermined number, said limiting unit determines that the number of said parameters must be reduced.

15. The program creating system as set forth in claim 1,

wherein said terminal device is a mobile terminal.

16. The program creating system as set forth in claim 7,

wherein said terminal device is a mobile terminal.

17. A program creating program causing a computer to realize:

a screen information storing unit which holds screen information that forms an input screen of a parameter to create a first program that realizes a predetermined process;

a providing unit which provides said screen information to a setting apparatus connected through a network;

an accepting unit which accepts the parameter input on the input screen displayed on the basis of said screen information from said setting apparatus through said network;

a producing unit which dynamically produces a source code of said first program on the basis of said parameter;

a compiling unit which compiles said source code to create said first program that can be executed by a predetermined terminal device; and

an instructing unit which detects that said source code is produced to instruct said compiling unit to compile the source code.

18. A program creating module causing a computer to realize:

a screen information storing unit which holds screen information that forms an input screen of a parameter to create a first program that realizes a predetermined process;

a providing unit which provides said screen information to a setting apparatus connected through a network;

an accepting unit which accepts the parameter input on the input screen displayed on the basis of said screen information from said setting apparatus through said network;

a producing unit which dynamically produces a source code of said first program on the basis of said parameter;

a compiling unit which compiles said source code to create said first program that can be executed by a predetermined terminal device; and

an instructing unit which detects that said source code is produced to instruct said compiling unit to compile the source code.

19. A program creating program causing a computer to realize:

an acquiring unit which acquires screen information that forms an input screen of a parameter to create a program that realizes a predetermined process through a network;

a display process unit which displays said input screen on a display unit on the basis of said screen information;

a managing unit which accepts an input of a parameter depending on said input screen to manage the parameter; and

a transmitting unit which outputs the parameter managed by said managing unit to a creating apparatus that creates said program through said network.

20. A program creating module causing a computer to realize:

an acquiring unit which acquires screen information that forms an input screen of a parameter to create a program that realizes a predetermined process through a network;

a display process unit which displays said input screen on a display unit on the basis of said screen information;

a managing unit which accepts an input of a parameter depending on said input screen to manage the parameter; and

a transmitting unit which outputs the parameter managed by said managing unit to a creating apparatus that creates said program through said network.

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